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LEE, SIU M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/791,924	Applicant(s) BRUNN ET AL.	
	Examiner SIU M. LEE	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-11 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-11 and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to art rejection of claims 1-11, 13-20 have been considered but are moot in view of the new ground(s) of rejection because of the amendment.

2. Applicant's arguments filed 2/11/2009 with respect to the 35 U.S.C. 101 rejection have been fully considered but they are not persuasive.

Applicant's argument:

The method of modifying an original shape of a pulse into a modified pulse exhibits zero crossing at bit edges within a sequence of bit periods is direct to transform underlying subject matter, i.e. a pulse, to a different state or thing is conformance with §101.

Examiner's response:

The transformation test of 35 U.S.C. 101 is related to a physical transformation, such as from a liquid state to a solid state. The present claims describes a process of modifying an original shape of a pulse into a modified pulse exhibits zero crossing at bit edges within a sequence of bit periods is **not** direct to transform underlying subject matter; however, the end product of the process is still a pulse. Therefore, there is no physical transformation involve in the process of the claim.

Based on the above rationale, the 35 U.S.C. 101 rejection is maintained.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 11, 16-18 are rejected under 35 U.S.C. 101 because the claims do not fall within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing (Reference the May 15, 2008 memorandum issued by Deputy Commissioner for Patent Examining Policy, John J. Love, titled “Clarification of ‘Processes’ under 35 U.S.C. 101”). The instant claims neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

The claims describes a method comprising the steps of receiving a plurality of filter tap coefficients; modifying an original shape of a pulse that is substantially located within a bit period to a modified pulse that is located within a sequence of bit periods using the plurality of filter tap coefficients; wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to the bit " period in which the pulse is substantially located; and wherein the modified pulse substantially minimizes ISI (Inter-Symbol Interference) at bit edges of each bit period within the sequence of bit periods to enhance detection of the pulse's original data value from the modified pulse.

Since no hardware is cited in the claim, the claim can be interpret as a method that perform on a piece of paper; wherein the filter tap coefficients are numbers and modifying an original shape of a pulse can be perform by multiplying the coefficient (numbers) to a pulse shape and generate a modified pulse. Therefore, the method can be performed mantled without any hardware.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1,2, and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and Heikkila et al. (US 2003/0174780 A1).

(1) Regarding claim 1:

Jaffe et al. discloses a Tomlinson Harashima precoder that comprises:

a filter tap coefficient module that provides a plurality of filter tap coefficients (Tomlinson-Harashima precoder 603 and coefficient ramping circuit 604 in figure 6, coefficient ramping circuit 604 provides a plurality of coefficient to a equalizer in the Tomlinson Harashima precoder 603);

a filter (equalizer shown in figure 7) that includes a plurality of filter taps such that each filter tap is adjusted according to one filter tap coefficient of the plurality of filter tap

coefficients (Tomlinson-Harashima precoder 603 includes a plurality of delay registers 71a-71d, the output of each of which is modified by taps 73a-73d, taps 73a-73d contains coefficients summed by adders 75a-75c and the output of the adders 75a-75c are combined with the information to be transmitted via adder 602, Mod2 77 truncates or rounds the output of adder 602 to provide the desired number of bits for input to transmitter 61, paragraph 0120);

wherein the filter is enabled to modify an original shape of a pulse in a communication channel (it is inherent that the equalizer as shown in figure 7 will change an original pulse of an input signal (a_n) by adding the output of adder 75a to the input signal (a_n) at adder 602 as shown in figure7) , wherein the modified pulse is located within a sequence of bit periods (Mod2 77 truncates or rounds the output of adder 602 to provide the desired number of bits for input to transmitter 61, paragraph 0120); wherein the modified pulse is to enhance detection of the pulse's original data value from the modified pulse (the use of Tomlinson-Harashima precoder is to reduce the undesirable effects of inter-symbol interference (ISI), paragraph 0065-0066).

Jaffe et al. fails to disclose (a) wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located; and (b) wherein the filter tap coefficient module employs an inverse of a communication channel transfer function and a pulse mapping to calculate the plurality of filter tap coefficients.

With respect to (a), Minuhin et al. discloses a filter (filter 64 in figure 1) wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located (series of data is input to the filter and filter by the filter 64, the out put of the filter is the waveform shown in figure 2, the zero crossings at each T period ((n+2)T, (n+3)T, (n+4)T, (n-1)T, (n-2)T, (n-3)T a shown in figure 2 except nT and (n+1)T) in the center, T is equal to the reciprocal of data rate, column 8, lines 25-28; therefore, when data rate is 1, T will be the bit length).

It is desirable wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located because it enforce the spectral properties and allows a controlled amount of inter-symbol interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Minuhin et al. in the apparatus of Jaffe et al. to improve the performance of the apparatus.

With respect to (b), Heikkila discloses wherein the filter tap coefficient module employs an inverse of a communication channel transfer function and a pulse mapping to calculate the plurality of filter tap coefficients (the second transceiver 602 estimate the channel frequency response and feedback the channel frequency response to the first transceiver 600 and the first transceiver 600 supply the feedback information to a pulse shaper 636 and the signal is supplied to a detector 638 and use as a control

information for the adaptive pulse shaper 608 to be used in transmission of the data signal, paragraph 0064-0065).

It is desirable for the filter tap coefficient module employs an inverse of a communication channel transfer function and a pulse mapping to calculate the plurality of filter tap coefficients because it compensates for the distortion cause by the channel. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Heikkila in the system of Jaffe et al. and Minuhin et al. to improve the integrity of the transmitted data.

(2) Regarding claim 2:

Heikkila et al. further discloses wherein:

the filter tap coefficient module calculates the plurality of filter tap coefficients in real time based on currently updated characteristic information of the communication channel that communicatively couples a transmitter and a receiver (the second transceiver 602 estimate the channel frequency response and feedback the channel frequency response to the first transceiver 600 and the first transceiver 600 supply the feedback information to a pulse shaper 636 and the signal is supplied to a detector 638 and use as a control information for the adaptive pulse shaper 608 to be used in transmission of the data signal, paragraph 0064-0065).

(3) Regarding claim 7:

Jaffe et al. further discloses that the plurality of filter taps includes d filter taps (73a -73d, paragraph 0120); and the plurality of filter tap coefficients includes d corresponding filter tap coefficients (79a-79d).

Jaffe et al., Minuhin et al. and Heikkila et al. fails to disclose the plurality of filter taps includes 3 filter taps; and the plurality of filter tap coefficients includes 3 corresponding filter tap coefficients.

Although Jaffe et al., Minuhin et al. and Heikkila et al. do not specifically disclose wherein the plurality of filter taps includes 3 filter taps; and the plurality of filter tap coefficients includes 3 corresponding filter tap coefficients, such limitation are merely a matter of design choice and would have been obvious in the system of Jaffe et al., Minuhin et al. and Heikkila et al.. Jaffe et al. teaches the use of a-d filter taps and filter tap coefficients to modify the transmitted signal. The limitation of using 3 filter taps and 3 filter taps coefficients do not define a patentably distinct invention over Van Jaffe et al., Minuhin et al. and Heikkila et al. since both invention as a whole are directed to mitigate the inter-symbol interference. Therefore, the usage of 3 filter taps and 3 filter tap coefficients would have been a matter of obvious design choice to one of ordinary skill in the art.

(4) Regarding claim 8:

Jaffe et al. discloses wherein:

The filter is implemented within a transmitter that is communicatively coupled to a receiver via the communication channel (figure 6 discloses that the Tomlinson-Harashima precoder is in the transmitter 601 which is coupled to the receiver 30 through channel 62).

(5) Regarding claim 9:

Jaffe et al. further discloses that the filter is implemented with a receiver that is communicatively coupled to a transmitter via the communication channel (decision feedback filter 57 in the receiver 53 in figure 6, paragraph 0110).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and Heikkila et al. (US 2003/0174780 A1) as applied to claim 1 above, and further in view of Kohlenberg et al. (US 3,876,941).

Jaffe et al., Minuhin et al. and Heikkila et al. disclose all the subject matter as discuss in claim 1, Jaffe et al. further discloses that the transmitter and the receiver are communicatively coupled via the communication channel (fig. 6 discloses a model of the transmitter and a receiver communicatively coupled via the communication channel).

Jaffe et al., Minuhin et al. and Heikkila et al. fail to disclose wherein the filter is implemented in a distributed manner part in a transmitter and part in a receiver.

However, Kohlenberg et al. discloses a filter network that is distributed between transmitter and receiver (abstract, lines 8-12).

It is desirable to disclose wherein the filter is implemented in a distributed manner part in a transmitter and part in a receiver because it can simplify and improve the effectiveness of the match filter communication (column 2, lines 53-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Kohlenberg et al. in the apparatus of Jaffe et al., Minuhin et al. and Heikkila et al. to improve the performance of the apparatus.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and Heikkila et al. (US 2003/0174780 A1) as applied to claim 1 above, and further in view of Gruber (US 5,249,150).

Jaffe et al., Minuhin et al. and Heikkila et al. disclose all the subject matter as discussed in claim 1, Heikkila et al. further disclose the filter tap coefficient module calculates the plurality of filter tap coefficients based on currently updated characteristic information of the communication channel that communicatively couples a transmitter and a receiver as discussed in claim 2.

Jaffe et al., Minuhin et al., and Heikkila et al. fails to disclose calculates the plurality of filter tap coefficients offline.

However, Gruber discloses calculates the plurality of filter tap coefficients offline (The coefficients of the optimal filter may be calculated offline, e.g. in advance, and be stored in a memory, e.g. a ROM, PROM or RAM, column 7, lines 55-58).

It is desirable to calculate the plurality of filter tap coefficients offline because this allows certain portions of the terminal to be powered up for a shorter period of time, with unnecessary circuitry such as the front-end circuitry being powered down to reduce power consumption. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Gruber in the apparatus of Jaffe et al., Minuhin et al. and Heikkila et al. to reduce the power consumption of the system.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and Heikkila et al. (US 2003/0174780 A1) as applied to claim 1 above, and further in view of Veeneman et al. (US 4,852,169).

Jaffe et al., Minuhin et al., and Heikkila et al. disclose all the subject matter as discussed in claim 1 except wherein a sum of absolute values of each filter tap coefficient of the plurality of filter tap coefficient is substantially equal to one.

However, Veeneman et al. disclose a method to normalize the filter coefficient so that the sum of all the coefficients is equal to one (column 7, lines 47-48).

It is desirable to have a sum of absolute values of each filter tap coefficient of the plurality of filter tap coefficient is substantially equal to one because it can reduce the number of filter elements, particularly in the number of multipliers. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Veeneman et al. in the apparatus of Jaffe et al., Minuhin et al., and Heikkila et al. to simplify the system.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and Heikkila et al. (US 2003/0174780 A1) as applied to claim 1 above, and further in view of NPL (Digital Communication by Edward A. Lee and David G. Messerschmitt, page 189).

Jaffe et al., Minuhin et al., and Heikkila et al. disclose all the subject matter as discussed in claim 1 except wherein the modified pulse substantially minimizes ISI (inter-Symbol Interference) at bit edges of each bit period within the sequence of bit periods; and the modified pulse allows a portion of ISI to exist at bit centers of each bit period within the sequence of bit periods.

However, NPL discloses that by forcing the pulse to correct zero crossings in p(t), it also forces the inter-symbol interference to zero at the zero crossing point (for a given impulse response of the channel, we can design g(t) and f(t) to force correct zero crossing in p(t) and forces the ISI to zero, NPL page 189) and it is obvious that the center of the modified pulse is not forced to zero, therefore, a portion of ISI will exist at bit centers of each bit period within the sequence of bit periods.

It is desirable to eliminate the inter-symbol interference at the zero crossing point because it reduces the distortion to the signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of NPL in the method of Jaffe et al., Minuhin et al., and Heikkila et al. to reduce the inter-symbol interference.

10. Claims 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and NPL (Digital Communication by Edward A. Lee and David G. Messerschmitt, page 189).

(1) Regarding claim 11:

Jaffe et al. discloses a method comprises:

receiving a plurality of filter tap coefficients (Tomlinson-Harashima precoder 603 receives a plurality of filter tap coefficients from the coefficient ramping circuit 604 as shown in figure 6, paragraph 0109);

modifying an original shape of a pulse that comprises a bit sequence (the Tomlinson-Harashima precoder 603 comprises an equalizer as shown in figure 7 that modifies the original pulse of the transmitted signal, paragraph 0120).

Jaffe et al. fails to disclose (a) the original shape of a pulse that is substantially located within a bit period to a modified pulse that is located within a sequence of bit periods using the plurality of filter tap coefficients; wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to the bit " period in which the pulse is substantially located; and (b) wherein the modified pulse substantially minimizes ISI (Inter-Symbol Interference) at bit edges of each bit period within the sequence of bit periods to enhance detection of the pulse's original data value from the modified pulse.

With respect to (a), Minuhin et al. discloses a filter (filter 64 in figure 1) wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located (series of data is input to the filter and filter by the filter 64, the out put of the filter is the waveform shown in figure 2, the zero crossings at each T period ((n+2)T, (n+3)T, (n+4)T, (n-1)T, (n-2)T, (n-3)T a shown

in figure 2 except nT and (n+1)T) in the center, T is equal to the reciprocal of data rate, column 8, lines 25-28; therefore, when data rate is 1, T will be the bit length).

It is desirable wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located because it enforce the spectral properties and allows a controlled amount of inter-symbol interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Minuhin et al. in the apparatus of Jaffe et al. to improve the performance of the apparatus.

With respect to (b), NPL discloses that by forcing the pulse to correct zero crossings in p(t), it also forces the inter-symbol interference to zero at the zero crossing point (for a given impulse response of the channel, we can design g(t) and f(t) to force correct zero crossing in p(t) and forces the ISI to zero, NPL page 189) and it is obvious that the center of the modified pulse is not forced to zero, therefore, a portion of ISI will exist at bit centers of each bit period within the sequence of bit periods.

It is desirable to eliminate the inter-symbol interference at the zero crossing point because it reduces the distortion to the signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of NPL in the method of Jaffe et al. and Minuhin et al. to reduce the inter-symbol interference.

(2) Regarding claim 13:

Jaffe discloses wherein calculating the plurality of filter tap coefficients in real time based on currently updates characteristic information of a communication channel

that communicatively Couples a transmitter and a receiver (the receiver 53 using the feed forward filter 64 and decision feedback filter 67 for generating the filter coefficient based on the changes of the channel and feedback the coefficients to the Tomlinson-Harashima precoder as shown in figure 6, paragraph 0108-0109).

11. Claims 16-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768).

(1) Regarding claim 16:

Jaffe et al. discloses a method comprises:

receiving a plurality of filter tap coefficients (Tomlinson-Harashima precoder 603 receives a plurality of filter tap coefficients from the coefficient ramping circuit 604 as shown in figure 6, paragraph 0109);

modifying an original shape of a pulse that comprises a bit sequence (the Tomlinson-Harashima precoder 603 comprises an equalizer as shown in figure 7 that modifies the original pulse of the transmitted signal, paragraph 0120).

Jaffe et al. fails to disclose the original shape of a pulse that is substantially located within a bit period to a modified pulse that is located within a sequence of bit periods using the plurality of filter tap coefficients; wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to the bit " period in which the pulse is substantially located; and

However, Minuhin et al. discloses a filter (filter 64 in figure 1) wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located (series of data is input to the filter and filter by the filter 64, the out put of the filter is the waveform shown in figure 2, the zero crossings at each T period ((n+2)T, (n+3)T, (n+4)T, (n-1)T, (n-2)T, (n-3)T a shown in figure 2 except nT and (n+1)T) in the center, T is equal to the reciprocal of data rate, column 8, lines 25-28; therefore, when data rate is 1, T will be the bit length).

It is desirable wherein the modified pulse has zero crossings located substantially at bit edges of each bit period within the sequence of bit periods except those bit edges immediately adjacent to a bit period in which the pulse is substantially located because it enforce the spectral properties and allows a controlled amount of inter-symbol interference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Minuhin et al. in the apparatus of Jaffe et al. to improve the performance of the apparatus.

(2) Regarding claim 17:

Minuhin et al. further discloses that the bit edges are not those bit edges immediately adjacent to the bit periods in which the pulse is substantially located (series of data is filtered by the filter 64, the out put of the filter is the waveform shown in figure 2, the zero crossings at each T period ((n+2)T, (n+3)T, (n+4)T, (n-1)T, (n-2)T, (n-3)T a shown in figure 2 except nT and (n+1)T) in the center, T is equal to the reciprocal of data rate, column 8, lines 25-28; therefore, when data rate is 1, T will be the bit length).

(3) Regarding claim 19:

Jaffe discloses wherein calculating the plurality of filter tap coefficients in real time based on currently updates characteristic information of a communication channel that communicatively Couples a transmitter and a receiver (the receiver 53 using the feed forward filter 64 and decision feedback filter 67 for generating the filter coefficient based on the changes of the channel and feedback the coefficients to the Tomlinson-Harashima precoder as shown in figure 6, paragraph 0108-0109).

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) as applied to claim 11 above, and further in view of NPL (Digital Communication by Edward A. Lee and David G. Messerschmitt, page 189).

Jaffe et al. and Minuhin et al. disclose all subject matter as discussed in claim 16 except wherein the modified pulse substantially minimizes ISI (Inter-Symbol Interference) at bit edge of each bit period within the sequence of bit periods.

However, NPL discloses that by forcing the pulse to correct zero crossings in p(t), it also forces the inter-symbol interference to zero at the zero crossing point (for a given impulse response of the channel, we can design g(t) and f(t) to force correct zero crossing in p(t) and forces the ISI to zero, NPL page 189) and it is obvious that the center of the modified pulse is not forced to zero, therefore, a portion of ISI will exist at bit centers of each bit period within the sequence of bit periods.

It is desirable to eliminate the inter-symbol interference at the zero crossing point because it reduces the distortion to the signal. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of NPL in the method of Jaffe et al. and Minuhin et al. to reduce the inter-symbol interference.

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) as applied to claim 16 above, and further in view of Gruber (US 5,249,150).

Jaffe et al. and Minuhin et al. disclose all the subject matter as discussed in claim 16, Jaffe et al. further disclose the filter tap coefficient are calculated based on communication channel that communicatively couples a transmitter and a receiver (transmitter and receiver as disclose in figure 6).

Jaffe et al. and Minuhin et al. fails to disclose calculates the plurality of filter tap coefficients offline based on predetermined characteristic information of a channel.

However, Gruber discloses calculates the plurality of filter tap coefficients offline (the coefficients of the optimal filter may be calculated offline, e.g. in advance, and be stored in a memory, e.g. a ROM, PROM or RAM, column 7, lines 55-58, it is obvious that when the coefficient are calculated in advance, the channel characteristic has to be based on a predetermined characteristics).

It is desirable to calculate the plurality of filter tap coefficients offline because this allows certain portions of the terminal to be powered up for a shorter period of time, with unnecessary circuitry such as the front-end circuitry being powered down to reduce

power consumption. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Gruber in the apparatus of Jaffe et al. and Minuhin et al. to reduce the power consumption of the system.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and NPL (Digital Communication by Edward A. Lee and David G. Messerschmitt, page 189) as applied to claim 11 above, and further in view of Gruber (US 5,249,150).

Jaffe et al., Minuhin et al. and NPL disclose all the subject matter as discussed in claim 11, Jaffe et al. further disclose the filter tap coefficient are calculated based on communication channel that communicatively couples a transmitter and a receiver (transmitter and receiver as disclose in figure 6).

Jaffe et al., Minuhin et al. and NPL fails to disclose calculates the plurality of filter tap coefficients offline based on predetermined characteristic information of a channel.

However, Gruber discloses calculates the plurality of filter tap coefficients offline (the coefficients of the optimal filter may be calculated offline, e.g. in advance, and be stored in a memory, e.g. a ROM, PROM or RAM, column 7, lines 55-58, it is obvious that when the coefficient are calculated in advance, the channel characteristic has to be based on a predetermined characteristics).

It is desirable to calculate the plurality of filter tap coefficients offline because this allows certain portions of the terminal to be powered up for a shorter period of time, with

unnecessary circuitry such as the front-end circuitry being powered down to reduce power consumption. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Gruber in the apparatus of Jaffe et al., Minuhin et al. and NPL to reduce the power consumption of the system.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe et al. (US 2004/0252755 A1) in view of Minuhin et al. (US 5,430,768) and NPL (Digital Communication by Edward A. Lee and David G. Messerschmitt, page 189) as applied to claim 11 above, and further in view of Veeneman et al. (US 4,852,169).

Jaffe et al., Minuhin et al. and NPL disclose all the subject matter as discussed in claim 1 except wherein a sum of absolute values of each filter tap coefficient of the plurality of filter tap coefficient is substantially equal to one.

However, Veeneman et al. disclose a method to normalize the filter coefficient so that the sum of all the coefficients is equal to one (column 7, lines 47-48).

It is desirable to have a sum of absolute values of each filter tap coefficient of the plurality of filter tap coefficient is substantially equal to one because it can reduce the number of filter elements, particularly in the number of multipliers. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ the teaching of Veeneman et al. in the method of Jaffe et al., Minuhin et al. and NPL to simplify the method.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SIU M. LEE whose telephone number is (571)270-1083. The examiner can normally be reached on Mon-Fri, 7:30-4:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Siu M Lee/
Examiner, Art Unit 2611
4/16/2009

/Chieh M Fan/
Supervisory Patent Examiner, Art Unit 2611